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LONG TERM IMPACT OF ABANDONMENT OF RAILWAY LINES

John F. Due

#247

Transportation Research Paper #7

College of Commerce and Business Administration
University of Illinois at Urbana-Champaign

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June 6, 1975

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LONG TERM IMPACT OF ABANDONMENT OF RAILWAY LINES

Most studies of the impact of the abandonment of railway lines upon the areas served have concentrated on relatively short term effects, those occurring within the first few years after abandonment. In such studies it is possible to ascertain the actual readjustments made to the loss of the line and the added transport costs. The Rutland study is a prime example of this type of work.¹ But of even greater concern is the long run impact--the influence that the abandonment of the line had upon the longer period development of the community. This is of course much more difficult to determine. No longer is the question one of adjustments made to the loss of the line, but of comparison of actual developments in the area with those that would have occurred had the rail line remained.

Approaches

The ideal approach would be a quantitative one, comparing the actual changes in population, per capita real income, output of manufacturing, agricultural output of various types, and, where relevant, mining output, with changes in the same data in control areas--ones identical in all other respects, but retaining rail service. While this approach is possible to a limited degree in some instances, general applicability is impossible, primarily because it is impossible to find suitable control

¹C. A. Theodore and F. S. Doody, The Economic Impact of the Discontinuance of the Rutland Railway (Boston: Boston University Bureau of Business Research, 1966).

areas. In alternative terms: economic development is influenced by so many variables, in addition to transport facilities, that it appears impossible to isolate the transport influences; situations in which "all other" variables in the control areas and those being studied remain unchanged or can be adjusted for appear to be nonexistent. In addition, data are often not available for the particular area affected by the abandonment, since most such data are compiled on a county-wide basis. Further study along these lines is obviously desirable, but may not prove to be at all fruitful.

Thus, in the cases under study, while quantitative data are presented (even though no good "control" area comparisons are possible) and do play a role in evaluation, stress is placed upon a review of actual developments in the areas, with an attempt to ascertain the differences that would likely have occurred if the rail line had remained, primarily on the basis of interviews with persons in the areas knowledgeable about trends and transport influences: traffic managers or general managers of business firms that might use rail service if it were still present; county agricultural agents, who are knowledgeable about transport influences in agriculture; chamber of commerce officials; and state development agency personnel. While no precise measure of effects results from this approach, it is possible to arrive at significant generalizations about overall impact and about the types of economic activity adversely affected.

The Cases

Four railroad lines were selected for this particular study, three in Nevada, one in Oregon. All were independent railroads (Class II,

under present I.C.C. classification); all were abandoned between 25 and 38 years prior to the date of study. The lines and the communities left without rail service were:

<u>Railroad</u>	<u>Miles</u> ¹	<u>Date of Construction</u>	<u>Date of Abandonment</u>	<u>Towns and Areas Left Without Rail Service</u>
Virginia and Truckee	47	1872; 1906	1950	Carson City, Minden, Nevada
Nevada Copper Belt	29	1909-1911	1947	Yerington, Mason, and the Smith Valley, Nevada
Tonopah and Goldfield	97	1904-1905	1947	Tonopah and Goldfield, Nevada
Great Southern	41	1905; 1913	1936	Dufur and Friend, Oregon

¹At the time of abandonment.

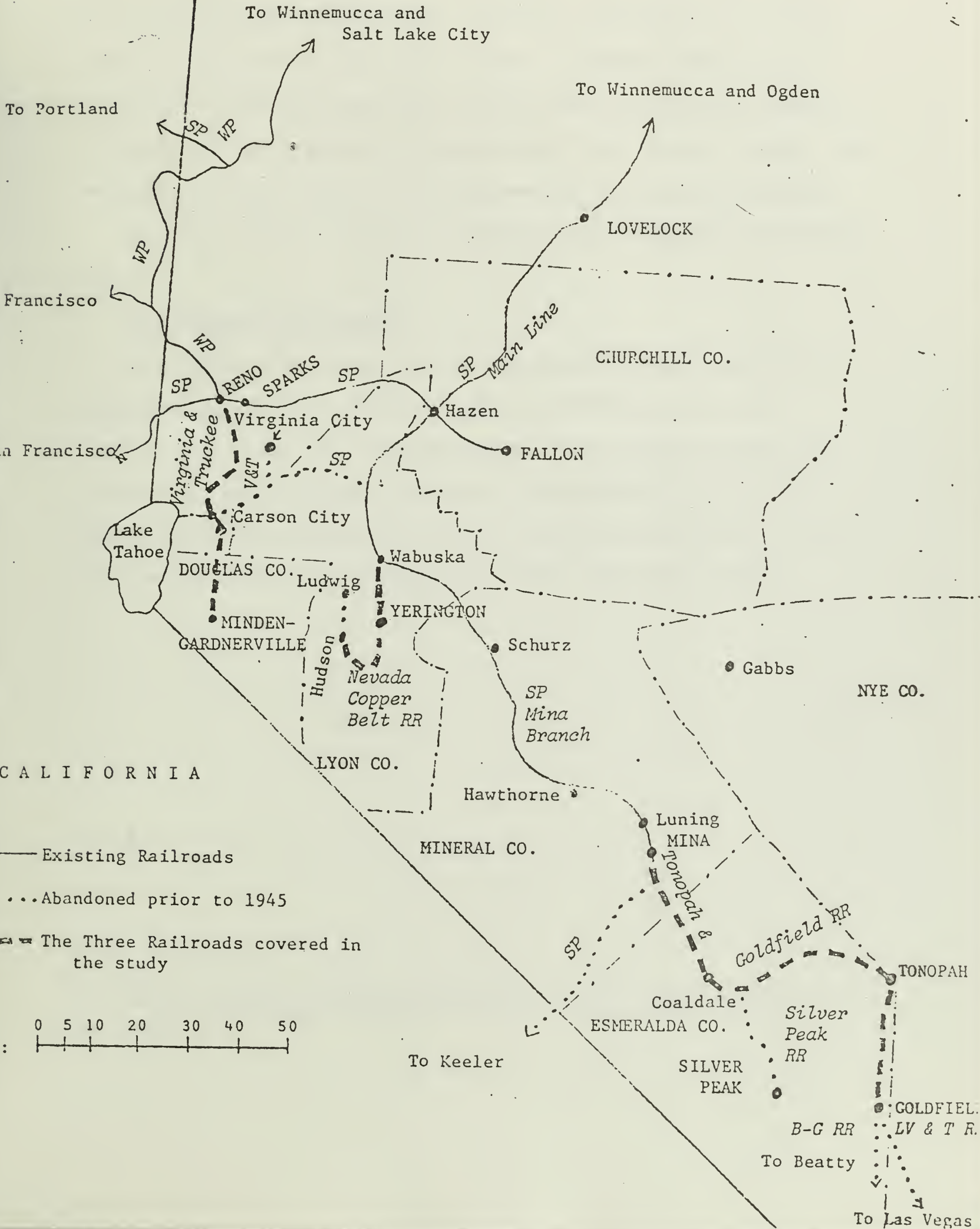
PART I. THE THREE NEVADA ROADS

The three Nevada roads were chosen because they were abandoned at approximately the same time, a single trip allowed analysis of the effects of all three, and the author was familiar with the backgrounds and the area. The territory served by the V and T and the NCB is one of semi-desert fertile valleys rendered productive by irrigation, separated by low mountain ranges covered with sagebrush and small trees. The Sierras rise a short distance to the west. The section served by the T and G, however,

*The author is indebted to a number of persons for assistance: Mr. John Sheehan, Secretary, and Mr. J. J. Rathbun, Statistician, Nevada Tax Commission; officials of the Nevada State Department of Economic Development, and particularly Mr. Dante Pistone; Mr. Robert Stewart, Press Secretary to Governor O'Callaghan; Mr. L. Koontz, retired Secretary of State; Mr. Wallace Peterson, County Agricultural Agent, Minden; Mr. John Purcel, County Agricultural Agent, Yerington; Mr. Fred Settlemeyer, Minden; to Assemblymen Dino of Yerington and Jacobsen of Minden; to officials of various business firms in the area. The College of Commerce, University of Illinois, provided funds for travel.

FIGURE 1. RAILROADS IN WEST-CENTRAL NEVADA

NEVADA



is a land of barren desert valleys and hills, a forbidding and desolate country with little water for any purpose. All three lines were built by financial interests associated with the mining industry and remained in these hands for a number of decades despite the decline in mining. All were absentee-owned, none in the later years by the principal shippers.

Each line will be considered separately and then general conclusions drawn.

The Virginia and Truckee¹

The Virginia and Truckee, one of the oldest railroads west of the Mississippi, was built in 1869 southward from the mining center of Virginia City to the mills along the Carson River, reaching Carson City in 1871, and thence northward to Reno and a connection with the Southern Pacific (then Central Pacific) in 1872. The road was promoted and built by three men prominent in Virginia City mining and banking circles.

¹U. S. Interstate Commerce Commission, FD 16407 (1950). See also D. F. Myrick, Railroads of Nevada (Berkeley: Howell North, 1962), pp. 136-61.

Controlling stock soon passed on to one of them, Darius Ogden Mills, and eventually all stock was owned by his grandson, Ogden Mills, Secretary of the Treasury in the Hoover administration. With the decline in mining and increased development of agriculture in the Carson Valley, a branch was built from Carson City south to Minden in 1906. The ending of all mining in Virginia City resulted in the abandonment of the original Carson City - Virginia City line in 1938.¹ The remaining line, Reno-Carson City-Minden, was 47 miles in length, relatively level except for a portion over the ridge north of Carson City, but with a substantial number of bridges.

The overall decline in mining and shift of some of the rather limited agricultural traffic to trucks resulted in continued deterioration of profits, particularly after 1925. From 1929 through 1949, the road covered operating expenses only in 1935 and 1939-1942 and taxes only in 1939, 1941, and 1942. The deficit in net operating income was \$39,000 in 1943, \$33,000 in 1944, \$23,000 in 1945, \$23,000 in 1946, and \$17,000 in 1947, averaging \$18,000 over the 20-year period (Table A1). According to testimony at the hearings to abandon, maintenance has been deferred for some 40 years, and \$2,800,000 was needed for rebuilding--probably a gross overstatement. The road had made a strenuous effort to get additional traffic in 1945, and had recovered the petroleum traffic lost during World War II under Federal requirements relating to rail and truck movements of petroleum. While 1948 traffic was twice that of 1939,

¹Abandonment of this portion is not included in the study, but obviously had little or no impact on Virginia City, a ghost town tourist center without other economic activity.

the road could not eliminate losses. The condition of the track was growing steadily worse (25 miles of track were laid with 56 pound rail from 70 to 73 years old, and all switches were of the stub type of the 1870s, long regarded as obsolete and dangerous). Yet the road had incredible ability to avoid derailments, having only four in the last seven years. Up to the end the road operated daily except Sunday freight service along with passenger, mail and express service, on mixed trains, partly to retain the \$22,000 a year mail contract--about 15 percent of its total revenue. Passenger traffic was not negligible, averaging around 3,800 a year--still carried in an old wooden coach built in the 1870s. Steam power was used to the end. While thought had been given to dieselization, funds were not available. The net cash drain over the last 20 years of operation had been covered by sale of equipment (some \$223,000 worth of equipment--rails from the Virginia City line, ancient locomotives, several of which went to the movie industry) and \$89,000 advanced by the estate of Ogden Mills.

The traffic of the road in the last years was primarily inbound, unlike most Class II railroads in the west: 1,250 cars inbound in 1947, 470 outbound (Table 1). Inbound cattle (mostly calves), gasoline, and other petroleum products accounted for half of the traffic in 1946; in 1947, there was substantial outbound traffic in gypsum, which ended the following year.

The Abandonment Hearings

The railroad management had obviously been reluctant to seek to abandon the road, and were not pressed by the trustees of the Mills

TABLE 1. TRAFFIC, VIRGINIA AND TRUCKEE RAILROAD
1946 AND 1947
CARLOADS

Commodity	1946			1947		
	Originating	Terminating	Total	Originating	Terminating	Total
<u>Interline</u>						
Hay	26			1		
Potatoes	39			21		
Onions	4 ¹			14		
Cattle	74	227		85	230	
Sheep	25	15		12	19	
Grains, feed		23			34	
Food products		48			68	
Ore	121 ¹			316 ²		
Gasoline		272			306	
Other petroleum products	1	276			293	
Coal		47			38	
Asphalt		31			82	
Phosphate		11				
Posts		16			18	
Lumber		81				
Cement		36			34	
Other manufactured goods and misc.	18	125		21	128	
<u>Total, Interline</u>	<u>308⁴</u>	<u>1,208⁵</u>		<u>470⁶</u>	<u>1,250⁷</u>	
On line			38 ³			86 ³
Overall total			1,554			1,806
LCL Traffic (tons)	(242)	(771)		(118)	(1,544)	

In 1948, 226 cars were originated, 1,049 terminated, 32 on line movements. Seventy-five cars terminated and 62 originated north of Carson City; 520 terminated in Carson and 89 originated; 59 terminated in Stewart; and 430 terminated in Minden, 71 originated.

- ¹ Mostly zinc ore
- ² Primarily gypsum
- ³ Calves
- ⁴ 150 from Minden
- ⁵ 442 to Minden
- ⁶ 74 from Minden
- ⁷ 450 to Minden

estate, but finally reached the point at which continued operation was virtually impossible. The case for abandonment was built strictly on the grounds of the operating losses and the condition of the line. The application was strongly protested, by Douglas, Ormsby, and Alpine counties, by the chambers of commerce in the area, by the Minden Stockgrowers Association, and by various individuals. The protestants stressed the adverse effect upon the communities and the potential increase in traffic in farm products, gypsum, and various ores. Cattlemen indicated preference for shipping to San Francisco by rail, claiming less loss. The Minden Creamery argued that costs on its inbound shipments would be higher by truck. Not all cattlemen, however, were much concerned because of the availability of trucking. Some persons protested that the road could cover its costs if it operated more efficiently, that costs of rebuilding were much less than indicated, and that the trustees of the Mills estate were primarily interested in a capital loss.

These arguments carried little weight. Data showed that the road operated at very low cost compared to similar roads (about 15¢ a ton mile). Strong effort had been made to increase traffic, and shippers were well satisfied with the service on carload traffic. Much of the hay and livestock traffic was already moving by truck and all could equally well. The shippers of the principal traffic--petroleum products--did not object to abandonment (and, apparently, had continued to use rail in part to aid the railroad). The Commission's decision was obvious: given the losses, which were undisputed, permission to abandon was granted.

The traffic originated and terminated per mile was about 40 carloads-- just above the I.C.C.'s 34 car rule--with a traffic of 39,000 net ton miles per mile of line (1947), somewhat above the figure required for viable operation, under the formula used by D.O.T. in its preliminary report for restructuring the northeast railroads. Had the road been able to dieselize and cut operation to two or three times a week, it might have been able to survive on the 1946-47 traffic level, but it could not with steam power and daily operation.

The Consequences

The general conclusion is that the abandonment of the Virginia and Truckee had relatively little impact on the area, but it did create a barrier to certain developments that might have occurred.

As shown in Table 2, population growth has been substantial. In the later 1940s, there were about 20,000 people in the area tributary to the line; Carson City's population was 3,000; Minden about 400. Today the total is roughly double; Carson City has reached 15,000, and Douglas county, 7,000 (although some of this is along Lake Tahoe). The population growth is attributable to several factors unrelated to the availability of a railroad line: the growth in the number of state employees; the increasing attractiveness of the area as a tourist and gaming center; "overflow" of tourists from the overcrowded Lake Tahoe area; some development as a retirement area; and, as noted below, growth of light industry. Unlike many areas once served by abandoned railroads, this is in no sense a declining area--but the growth is unrelated to railroad service. Various sectors will be reviewed:

TABLE 2. POPULATION TRENDS, AREAS SERVED BY THE ABANDONED RAILROADS, PLUS CHURCHILL COUNTY, 1890-1970

<u>Counties</u>	<u>1890</u>	<u>1900</u>	<u>1910</u>	<u>1920</u>	<u>1930</u>	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>
Churchill	703	830	4,257	4,649	5,075	5,317	6,161	7,452	10,513
Douglas	1,551	1,534	2,159	1,825	1,840	2,056	2,029	3,481	6,882
Esmeralda	2,148	1,972	7,385	2,410	1,077	1,554	614	619	629
Lyon	1,987	2,268	4,516	4,078	3,810	4,076	3,679	6,143	8,221
Mineral ²	--	--	7,384	1,848	1,863	2,342	5,560	6,329	7,151
Nye	1,290	1,140	12,163	6,504	3,989	3,606	3,101	4,374	5,599
Ormsby	4,883	2,898	3,796	2,543	2,221	3,209	4,173	8,063	15,468 ¹
<u>Cities</u>									
Carson City	3,950	2,100	2,466	1,685	1,596	2,478	3,082	5,163	15,468 ¹
Fallon	--	12	741	1,753	1,758	1,911	2,400	2,734	2,959
Goldfield	--	--	4,836	1,558	325	554	336	185	200
Mason	--	--	125	259	259	80	80	300	300
Mina	--	--	325	425	400	450	450	425	425
Minden-Gardnerville ³	59	438	850	1,223	600	1,040	776	1,300	1,370
Tonopah	--	--	3,900	4,144	2,115	1,560	1,375	1,679	1,716
Wabuska	--	21	50	110	92	75	75	15	15
Yerington	--	182	682	1,169	1,005	964	1,157	1,764	2,010

SOURCE: U. S. Census Volumes; Rand McNally Atlases. Figures for places under 1,000 are estimates and not entirely accurate.

¹ Carson City merged with Ormsby county in 1969.

² Formed out of Esmeralda county.

³ The towns are adjacent but technically separate. Gardnerville was the original settlement, but in 1905 the townsite of Minden was laid out by the principal landowners of the county, the Dangberg family, and the railroad, using Dangberg land for its right of way, never went on to Gardnerville.

1. Manufacturing and wholesale distribution. Carson City has deliberately sought light industry in the last decade and has established an industrial park. It has succeeded in attracting several firms of this type, the most important being Mallory Electric, a manufacturer of electric ignition equipment, primarily for boats. But all of Mallory's shipments, inbound and outbound, are made in LTL quantities; all move by truck (except perhaps five percent by air); and all would move by truck even if a rail line were available. Minden has a similar plant, Bently Nevada electronics, manufacturing industrial monitoring devices, and also shipping by truck. This type of activity--the type this area seeks to lure--does not require or use rail service at all. The Carson Valley is not suitable for heavy industry, even if a rail line were available, because of lack of water and environmental problems.

The lack of a rail line, however, has precluded one major potential development, namely, that of wholesale distribution activity. The Reno-Sparks area 30 miles to the north of Carson City has become a major distribution center, goods coming in from the east, primarily by rail, and being distributed in Nevada and California, largely by truck but partly by rail. For this activity rail service is imperative. Given the somewhat limited number of sites for such purposes in the Reno-Sparks area, some of this development might have come in the area south of Reno alongside the railroad right of way, and in Carson City. Fallon, east of Reno, and still having a rail line, is now pushing for this type of development. But it is precluded in the Carson-Minden area.

2. Agriculture. The potential loss to agriculture was not great at the time of abandonment of the rail line; even in the late forties, it was estimated that 80 percent of the hay moving out of the valley and 50 percent of the cattle (most of which went to Los Angeles) went by truck anyway. The Carson Valley is now primarily a producer of feeder cattle and alfalfa hay (Table 3); there is now very little grain, potato or onion production or cattle feeding. Earlier attempts to produce potatoes did not prove to be successful because of frost danger and effects on the soil, and cattle feeding has become more specialized by area. The alfalfa hay is trucked to California for use by dairies, much to Petaluma, and some to feed lots in the Smith valley to the east of Minden. Today, nationally, neither hay nor livestock move by rail, except in unusual circumstances, even when rail service is available. Accordingly, from the standpoint of outbound shipments, rail would not be used. Inbound shipments for agriculture are limited because there is no cattle feeding and little grain is required. The old flour mill in Minden became a feed mill, and then ceased to function at all, given the changing pattern of agriculture. Relatively little fertilizer is used; all is already-mixed dry fertilizer and is trucked in bulk from Stockton, California.

There is some milk production, and one of the chief opponents of abandonment was the Minden Butter Company, which shipped in some of its supplies by rail. Ultimately the company went out of business (but not because of the loss of the railroad) and the building was taken over by Bently Nevada, the electronics firm. But Beatrice Foods does have a creamery on the east side of the valley.

TABLE 3. AGRICULTURAL PRODUCTION IN DOUGLAS COUNTY,
1939-1969

	<u>1939</u>	<u>1944</u>	<u>1949</u>	<u>1959</u>	<u>1969</u>
Number of farms ¹	127	342	252	168	99
Acreage in farms	133,000	217,000	227,000	221,000	161,000
Value of farm output, total	995,000		3,727,000	2,966,000	3,268,000
Livestock					3,096,000
Cattle, number	18,000	19,000	19,000	21,000	24,000
Sheep, number	39,000	34,000	33,000	21,000	7,000
Hay: Acreage	15,000	24,000	13,000	13,000	16,000
Output, tons	26,000	53,739	20,000	26,000	44,000
Wheat: Acreage	2,000	1,000	1,000	400	n
Output, bushels	46,000	27,000	31,000	6,000	n
Barley: Acreage	2,000	1,800	2,000	700	400
Output, bushels	101,000	7,500	50,000	28,000	24,000
Potatoes: Acreage	86	52	n	n	n
Output, 100 wt.	18,000 (bu.)	10,213 (bu.)	n	n	n

¹About half of the farm land in the county is owned by the Dangberg family, descendants of the original settlers.

n: negligible

SOURCE: U. S. Census of Agriculture, respective years. Figures have been rounded to the nearest thousand to avoid the impression of a high degree of accuracy. Agricultural acreage and output figures are not entirely accurate.

The conclusion about agriculture is obvious: an area producing almost solely feeder cattle and hay, requiring little fertilizer, would not use a rail line if there were one,¹ and agriculture suffered no loss whatever from loss of the rail line.

Other Activity

Mining activity is very limited; except for Virginia City, it was never very significant. Gypsum production, source of about one carload of freight a day in 1947, ceased in 1948 and has never revived. Unlike the area to the south, it does not appear that there is long range potential for mining development.

Another type of inbound traffic in 1948 was lumber. There are two major retail lumber yards in the area served. The assistant manager of one of the yards suggested that having a rail line would facilitate some lumber traffic and allow lower rates. All lumber is now trucked from suppliers in Sacramento, rather than from the rail head in Reno. Apparently the buying practices of the firm which owns both yards is such as to result in this practice, even for its yards having rail sidings, rather than utilizing direct shipments from the mills. Thus the significance of not having a rail line is not very great, given the availability of lumber supplies within economical trucking distance.

The abandonment of the line, however, may have hampered sawmilling and lumber milling in the area. The source of logs is Forest Service timber in the Sierras; there is no marketable lumber on the Nevada

¹The farm extension agent for the county stressed this point.

mountains surrounding the Carson valley. At one time there was substantial lumber milling in the Carson City area; this disappeared long ago, and only one sawmill operates today, a small one south of Gardnerville. The pine lumber is primarily shipped to California, all by truck, and used to a large extent for making boxes and crates. The chips are trucked to Stockton, California for export to hardboard mills in Japan. Almost certainly the chips could move more cheaply by rail, and the access to rail would have allowed greater market potential for the lumber and lower cost. There is little possibility of much increase in lumber because of limited supply of timber.¹

Conclusions

The net effect of the abandonment of the Virginia and Truckee upon the area has been slight; agriculture was not injured; light industry has been lured to the area; population has grown. The major potentially adverse effect was in preventing the type of development of wholesale distribution that has become important in the Reno-Sparks area, one that requires direct rail access. There might have been lumber mill development in the Minden area if the line had been retained.

An incidental difference between the Virginia and Truckee and other lines is that while, typically, a railroad abandoned for 25 years is

¹Letter from U. S. Forest Service, Carson City, Nevada, May 8, 1975.

completely forgotten, the V and T is very well known and almost revered in the area. A substantial amount of rolling stock has been assembled south of the city and elsewhere; the big stone shop building still stands; and various groups have for years promoted rebuilding of the original line from Carson City to Virginia City, up a steep mountainside, as a tourist attraction--which undoubtedly it would be. Unlike the remainder of the line, this portion of the right of way is largely intact. Had the line lasted another decade or so, it might well have been preserved as an historical monument and tourist attraction.

The Nevada Copper Belt Railway¹

The Nevada Copper Belt extended from the station of Wabuska, on the Southern Pacific's Mina branch, 12 miles southward to Yerington, the county seat of Lyon county, and then on south to the town of Mason and through the Mason valley, west through the narrow Wilson canyon of the West Walker River into the Smith valley, and north to the station of Hudson, a shipping point for the Smith valley but not actually a town, 29 miles from Wabuska. The line once extended another 9 miles on north up the side of the mountains to Ludwig, but this portion was inoperative after 1933 and was abandoned in 1942. The Copper Belt was built in 1910-11 by Boston financial interests headed by A. J. Orem, who had formed the Nevada Douglas Copper Company to mine copper deposits in the Ludwig area that had been worked sporadically since the 1860s. A smelter was built at Thompsons, two miles east of Wabuska, the line extended to the smelter, and ore hauled from the mines at Ludwig and other points along the line. But copper production was sporadic, and in 1929 the smelter was closed and dismantled. The line was marginally profitable at best, depending more and more on agricultural produce from the Smith and Mason valleys. The company entered bankruptcy in 1925 and was operated by a receiver until 1942 when, for unknown reasons, it was purchased by the Parr Terminal interests of Richmond, California.² Until 1945 the road operated twice-daily freight and passenger service from the shops in Mason through Yerington to Wabuska to connect with the Southern Pacific's north and southbound Mina branch trains, but these runs were

¹Myrick, Railroads of Nevada, op. cit., pp. 214-29 gives the history.

²There is some indication that the Parr family purchased the road because of the interests of younger members of the family in attempting to operate a smaller railroad.

often operated with a Hall Scott motor car, steam power being used only when there were sufficient freight cars to warrant it. Service was operated triweekly to Hudson (and originally to Ludwig). The total population in the area served was only 2,000 in 1945.

Traffic

The traffic in the mid forties was predominantly outbound--in 1944 609 cars, compared to 319 inbound; the population of the area was so small that total inbound traffic potential was limited and trucks had already taken much of the merchandise traffic. The pattern was as follows, by station, with the principal products noted (1944):

	<u>Inbound</u>	<u>Outbound</u>
Yerington	237 (gasoline, fuel oil)	56 (hay)
Mason	65 (cattle)	258 (copper ore, gypsum, potatoes, cattle)
Wilson	1	63 (potatoes)
Hudson	14 (sheep)	224 (potatoes, hay)
Other	2	8

SOURCE: Interstate Commerce Commission FD 15358 (1947).

Traffic originating and terminating was 32 cars per mile, just below the I.C.C. minimum figure; ton miles per mile of line was 14,689 in 1974 (9,759 in 1940), well below the D.O.T. minimum for viability. The portion from Mason to Wabuska, however, had 44 cars per mile--a figure that should have allowed this portion of the road to survive with 1944-45 traffic.

NEVADA COPPER BELT RAILROAD.
 Pres. & Gen. Mgr., Salt Lake City, Utah.
 VICE PRES., Salt Lake City, Utah.
 214 P. Salt Lake City, Utah.
 MOORE, Gen. Mgr.
 T. H. LEVER, Sup. Eng. & M. Engr.

ARRIVE	DEPART	ARRIVE	DEPART
12:00	12:15	12:45	1:00
1:00	1:15	1:45	2:00
2:00	2:15	2:45	3:00
3:00	3:15	3:45	4:00
4:00	4:15	4:45	5:00
5:00	5:15	5:45	6:00
6:00	6:15	6:45	7:00
7:00	7:15	7:45	8:00
8:00	8:15	8:45	9:00
9:00	9:15	9:45	10:00
10:00	10:15	10:45	11:00
11:00	11:15	11:45	12:00

Trains marked * run daily; † daily, except Sunday; ‡ Tuesday, Thursday and Saturday. § Telegraph stations.
 Connection. — With Southern Pacific Lines.

NEVADA COPPER BELT RAILROAD.
 J. I. WILSON, Receiver, Yerington, Nev.
 GEO. F. WILLIS, Asst. Sec'y and Asst. Treas.
 P. H. COOK, General Manager, Traffic Manager and Purchasing Agent, Mason, Nev.
 H. H. KOEHLER, Auditor, Ludwig, Nev.
 T. H. LEVER, Master Mechanic, Mason, Nev.

ARRIVE	DEPART	ARRIVE	DEPART
12:00	12:15	12:45	1:00
1:00	1:15	1:45	2:00
2:00	2:15	2:45	3:00
3:00	3:15	3:45	4:00
4:00	4:15	4:45	5:00
5:00	5:15	5:45	6:00
6:00	6:15	6:45	7:00
7:00	7:15	7:45	8:00
8:00	8:15	8:45	9:00
9:00	9:15	9:45	10:00
10:00	10:15	10:45	11:00
11:00	11:15	11:45	12:00

Trains marked * run daily; † daily, except Sunday; ‡ Tuesday, Thursday and Saturday. § Telegraph stations.
 Connection. — With Southern Pacific Lines.

1937

(E) WABUSKA, MASON, LUDWIG
 Nevada Copper Belt R. R.

ARRIVE	DEPART	ARRIVE	DEPART
12:00	12:15	12:45	1:00
1:00	1:15	1:45	2:00
2:00	2:15	2:45	3:00
3:00	3:15	3:45	4:00
4:00	4:15	4:45	5:00
5:00	5:15	5:45	6:00
6:00	6:15	6:45	7:00
7:00	7:15	7:45	8:00
8:00	8:15	8:45	9:00
9:00	9:15	9:45	10:00
10:00	10:15	10:45	11:00
11:00	11:15	11:45	12:00

A more detailed breakdown of traffic by commodity, for 1944, was as follows:

TABLE 4. TRAFFIC, NEVADA COPPER BELT, 1944
CARLOADS

<u>Commodity</u>	<u>Inbound</u>	<u>Outbound</u>
gasoline	74	
fuel oil	66	
other petroleum products	12	
coal	28	
wheat	33	
cattle	45	
sheep		22
hay		123
potatoes		235
gypsum		40
copper ore		149
other	<u>61</u>	<u>40</u>
Total	319	609

SOURCE: Interstate Commerce Commission FD 15438 (1947).

The Application to Abandon

The road applied for permission to abandon in August, 1946, and because of protests, hearings were held.¹ The railroad stressed the continued operating losses; the line owed \$101,514 to Parr Terminals for funds advanced to cover operating losses that had been incurred since 1942. Some deferred maintenance was noted; the track was in fair shape from Wabuska to Mason, some ties being needed, but major work was required

¹U. S. Interstate Commerce Commission, FD 15438 (1947).

beyond Mason. The problem was basically not one of track or equipment (the line had a modern 1925 ALCO steam locomotive plus a small gasoline Plymouth motor and two Hall Scott motor cars), as with some lines seeking abandonment, but of continued operating losses (Table A2). Salvage value was estimated at only \$65,000 for the rail, \$20,000 for the rolling stock. The road noted the favorable rate divisions it received from the Southern Pacific-- 36½% of the rate on hay to the San Francisco area, 30½% on inbound gasoline, for example. The railroad also stressed the limited potential increase in traffic, the existing diversion to trucks, and lack of any real injury to shippers from abandonment. Rail and truck rates on petroleum products were identical, and these products could therefore move by truck (at the time, Standard of California and Union still preferred rail shipments, but the other oil companies were already shipping by truck). About half the hay moved out of the valley by truck and a portion of potatoes, and at least 95 percent of the livestock was trucked. Only the copper ore movements--then negligible--would experience higher costs because of the need to truck to Wabuska. The gypsum shipments already had to be trucked from the mine to Mason.

Nevertheless, the abandonment was opposed--but not as strongly as that of the V and T. The Farm Bureau, the Irrigation District, the Rotary Club in Yerington, and some farmers were the principal opponents, stressing the higher costs for farm product transport and the effects upon the community. The county agent indicated that potatoes and onions moved almost entirely by rail to California; rates would be higher by truck, and frost damage would be much greater on truck movements during the winter.

The rail line also facilitated bringing in feeder cattle. Some farmers indicated preference for use of rail in shipping hay, particularly to Los Angeles, and the ability to reconsign shipments of potatoes and onions while they were en route. Predictions were made that more land would be irrigated, and shipments increased. One mine operator indicated that trucking to Wabuska might necessitate closing of the mine.

Commission approval of course was forthcoming, given the demonstration of operating losses and the absence of concrete evidence of injury from abandonment. In March of 1947 operations ceased.

The Effects

The overall effects of the abandonment on the development of the area have not been significant, but, as explained below, the abandonment proved to be a mistake and resulted in substantially higher costs for the mining industry. Population, employment, and output have risen steadily; Yerington has increased in population from 964 in 1940 to 2,010 in 1970, and the county from 4,078 to 8,221 in the same years (Table 2). Yerington is hardly a boom town--but it has improved materially in appearance over the last thirty years. It is off the tourist path and thus has lacked this stimulus that has benefitted other Nevada towns--but this is completely unrelated to the railroad.

1. Agriculture. The two valleys that make up the country's agricultural area are very similar--the Smith valley to the west, irrigated from the West Walker River, and the Mason valley, which includes Yerington, to the east, irrigated by the East and West Walker Rivers, which join in the valley. Crops require irrigation, and there is little prospect for expanded

TABLE 5. AGRICULTURAL OUTPUT IN LYON COUNTY,
1939-1969

	<u>1939</u>	<u>1944</u>	<u>1949</u>	<u>1959</u>	<u>1969</u>
Number of farms	342	336	331	289	260
Acreage in farms	179,000	239,000	238,000	193,000	279,000
Value of farm output, total	1,098,000		3,555,000	7,558,000	8,280,000
Livestock					6,332,000
Cattle, number	21,000	30,000	26,000	35,000	37,000
Sheep, number	69,000	31,000	34,000	26,000	16,000
Hay: Acreage	24,000	22,000	26,000	24,000	31,000
Output, tons	52,000	57,765	63,000	79,000	112,000
Wheat: Acreage	1,000	1,600	2,000	1,000	800
Output, bushels	36,000	48,000	63,000	36,000	41,000
Barley: Acreage	4,000	4,800	4,000	3,000	1,600
Output, bushels	127,000	192,000	164,000	113,000	7,900
Potatoes: Acreage	844	1,216	500	800	381
Output, 100 wt.	173,000 (bu)	242,000 (bu)	95,000	207,000	56,700

SOURCE: U. S. Census of Agriculture, respective years.

irrigation because of lack of water supply.¹ Already the water diversion is drying up Walker Lake, into which the river flows, to the complaint of fishermen and environmentalists.

The principal crop is alfalfa hay (Table 5). The valleys are among the most efficient alfalfa producers in the country, yielding three to four crops a year, with an unusually high protein content of 20 to 21 percent. A portion of this hay is shipped out, primarily to dairy farms in Petaluma and Stockton, California (200 to 300 miles). All is trucked; even at the time of abandonment of the rail line half was trucked, and trucks easily took over the entire movement.

The remainder of the hay is fed to cattle; the Mason valley has become a major cattle fattening area. The hay is produced locally, as well as a limited amount of grain. Much of the grain (barley and wheat) is trucked in from southern Idaho--250 miles or so; some comes from the Midwest, primarily corn, by rail to Wabuska or to Fallon (to which rates are somewhat lower). All cattle are trucked and all would be even if there was a rail line. But the loss of the rail line has resulted in somewhat higher costs arising from the need for trucking corn from Wabuska. It is also possible that some wheat and barley might come in by rail if the line were still in, but the cost difference would be slight. Local grain production is more or less incidental, arising out of the need to rotate alfalfa land to grain for two years every six or seven years to kill off various pests.

¹State of Nevada, Division of Water Resources, Walker River Basin (Carson City, 1973).

A meat packing plant is located in Yerington in conjunction with feed lots. The firm distributes its meat entirely by its own trucks and brings in grain from southern Idaho by the same means. Some grain at times is brought in from the Midwest by rail and trucked from Fallon. The firm regards use of its own trucks as imperative for efficient operation and the loss of the rail line is not significant.

Potato production, one of the sources of rail traffic when the line was operating, has fallen to virtually nothing--1,500 acres at one time to 150 currently. There were several reasons, unrelated to the loss of the rail line--the adverse effect on the soil; a risky market; failure of farmers to stick with the product and develop good marketing facilities, and some unscrupulous activity. Potato production has become more and more specialized by area; in Nevada, Humboldt county has become the primary potato producer, with a large R. T. French processing plant (for the lower grade potatoes) recently built in the county--one for which rail service was imperative. This is located on the Southern Pacific main line. There has been some revival of onion and garlic production, largely for seed.

Substantial amounts of fertilizer are used, mostly dry, some liquid, but all is trucked from California points, already blended. This is true also in areas in western Nevada still having rail service.

Farm machinery comes primarily from the east by rail to Wabuska, except about half of the tractors, trucked from California. If the machinery could move into the valleys directly by rail, cost would be slightly lower.

On the whole, a conclusion confirmed by the present county agent, loss of the rail line had little serious effect on agriculture--primarily because of the dominance of hay and cattle production--but partly because Wabuska is only 14 miles away. But clearly it would be of some advantage, mainly on incoming shipments of farm machinery and feed grains, to have the rail line into the valleys and some use would still be made of it. One problem in the Smith valley was that the line merely reached the east edge of the valley, as its location was dictated by mining considerations.

2. Mining. The railway was abandoned in 1947. Only five years later, Anaconda Copper Company commenced to mine copper ore on a large scale at a location named Weed Heights, alongside the railway right of way adjacent to the Yerington station. About 600 persons are employed, and 20 to 30 cars of concentrate and other output are shipped weekly. There are two operations--a concentration mill and a leaching plant--since there are both sulfide and oxide ores. The products are trucked to Wabuska for shipment by rail to the smelter in Anaconda, Montana. A major element of inbound traffic is sulfur, used to make sulfuric acid for the leaching process; this comes from Canada to Wabuska by rail and is trucked to the mill. Anaconda operates its own trucks (five in number), 20 to 26 tons net, for hauling the concentrate; about half of the trips return empty, the others bring back the sulfur. The company is able to truck at a substantially lower figure than the \$4 a ton contract hauler charge. Grinding rods and some other inbound supplies come from the east by rail to Wabuska; some items are trucked by contract carrier from the San Francisco area. Detinned tin cans, used in the leaching operation,

come partly by contract carrier truck from Los Angeles, partly by rail from Roseville, California, to Wabuska. To facilitate handling of LTL shipments and to lower costs, Anaconda runs its own truck three times a week to Reno to pick up various inbound supplies.

When the plant was built in 1951-52, the company did consider rebuilding the rail line, but made the decision not to do so, in the belief that ore was available only for ten years. Operations have now been carried on for 23 years, with the expectation of at least 10 years additional. The company recognizes that the decision not to build the line was an error. If the Copper Belt had still been in operation, it would have been used, only minor track extension being necessary; not only would there have been a very substantial reduction in transport costs over the years,¹ but the line would have been available for agricultural and other use as well. The elimination of heavy trucking on the two lane oil-macadam road from Yerington to Wabuska would have been advantageous to other users of the road and would have lessened maintenance costs.

In conclusion: the experience with the Copper Belt provides an excellent example of a situation in which abandonment would not have occurred if expectations about the future had been correct. Had the line been retained, substantial economies would have resulted. But this could not be foreseen in 1946. Operating losses were being incurred; the dominant farm traffic was being taken over more and more by trucks, and there was no reasonable hope of improvement. The decision to abandon, given the knowledge at the time, was obviously a correct one--yet it proved to be wrong as events unfolded.

¹The author's rough estimate is that the additional cost exceeds \$2 million.

TONOPAH AND GOLDFIELD RAILROAD CO.

Total Mileage, 110.

Western Union Telegraph.

H. B. CUTLER, President, Philadelphia, Pa.

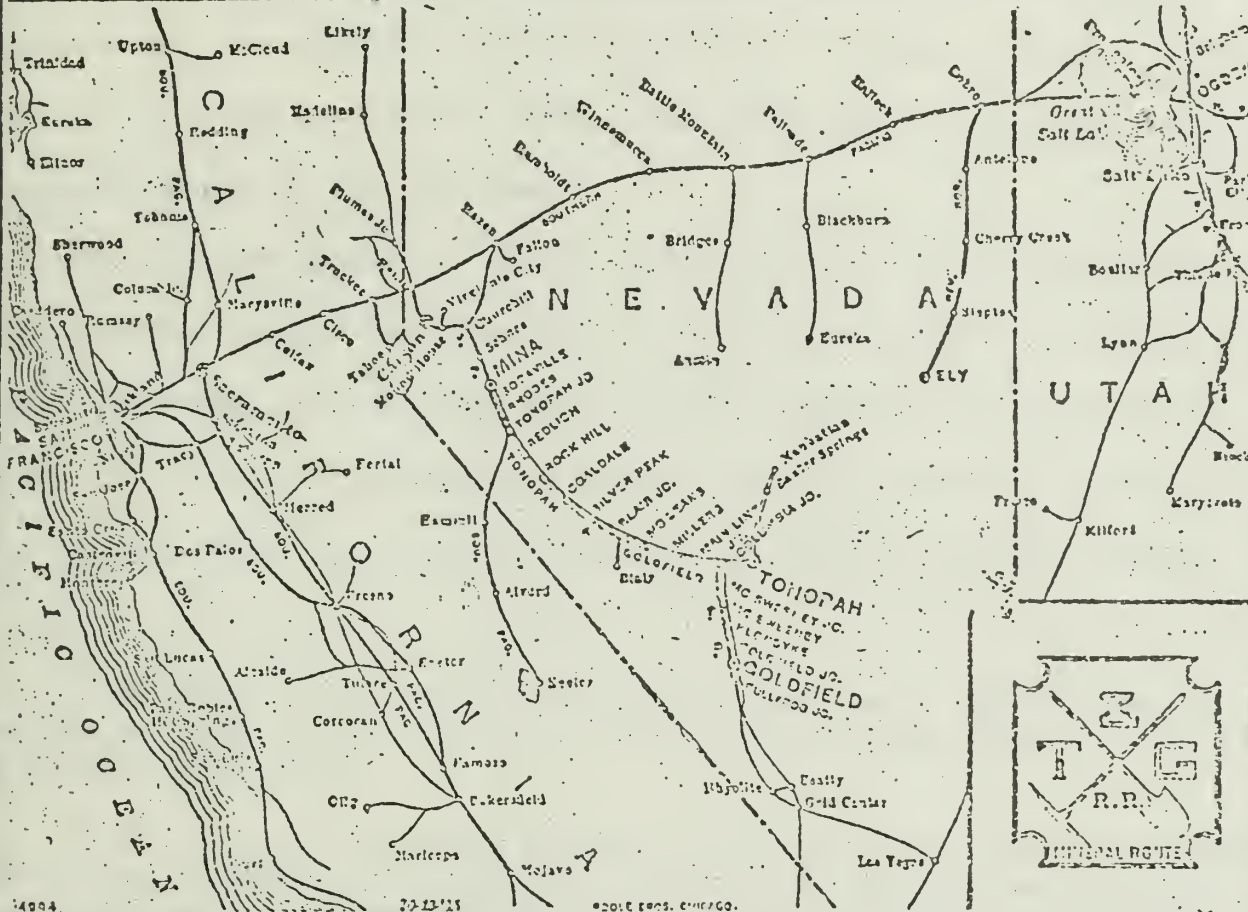
O. A. HIOBEE, Vice-President,
 W. D. FORBES, Vice-Prest. and Traffic Mgr.,
 WM. F. HENSLAW, Secretary and Treas.,
 J. HARVEY WHITEMAN, General Solicitor.

Philadelphia, Pa.
 Goldfield, Nev.
 Philadelphia, Pa.

HUGH H. BROWN, General Counsel,
 T. A. PRATZER, Assistant Treasurer,
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Tonopah, Nev.
 Goldfield, Nev.

PHILADELPHIA OFFICES—571 BULLITT BUILDING.



MOTOR CAR No. 23	Mileage	August, 1920	Mileage	MOTOR CAR No. 24
4:50 P.M.	6:45 A.M.	0 lvs. Goldfield	0:35 A.M.	9:35 A.M.
7:15	7:15	22 Klamath	0:01	0:01
7:49	7:49	22 McSwainy	0:37	0:37
8:10	8:10	21 lvs. Tonopah	8:10	8:10
8:20	8:20	31 lvs. Millers	7:40	7:40
8:59	8:59	41 Mel. Ans.	6:11	6:11
9:32	9:32	55 Blair Junction	5:59	5:59
9:51	9:51	60 Silver Peak	5:43	5:43
10:02	10:02	71 Condit's	5:11	5:11
10:14	10:14	71 Rock Hill	4:51	4:51
10:35	10:35	81 Colliedale	4:25	4:25
10:55	10:55	91 Silver Peak	4:12	4:12
11:15	11:15	91 Tonopah Junction	3:11	3:11
11:45 A.M.	11:45 A.M.	100 lvs. Mina	3:13 A.M.	3:13 A.M.
12:05 P.M.	12:05 P.M.	100 lvs. Hazen (No. 10)	0:35 A.M.	0:35 A.M.
4:29 P.M.	4:29 P.M.	24 lvs. Hazen	0:55 P.M.	0:55 P.M.
6:29 P.M.	6:29 P.M.	24 lvs. Reno	7:23 P.M.	7:23 P.M.
7:39 A.M.	7:39 A.M.	38 lvs. San Francisco	7:21 A.M.	7:21 A.M.

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 all important cities and towns East, West,
 North and South.

S.P. No. 8	S.P. No. 20	S.P. No. 2	S.P. No. 8	S.P. No. 19	S.P. No. 1
7:35 A.M.	7:35 A.M.	3:07 P.M.	6:55 P.M.	1:00 A.M.	6:35 A.M.
10:20 A.M.	10:20 A.M.	3:37 P.M.	4:47 P.M.	12:50 A.M.	4:37 A.M.
5:10 A.M.	5:30 P.M.	12:45 P.M.	11:40 P.M.	9:15 A.M.	2:37 P.M.
7:35 A.M.	7:45 P.M.	4:30 P.M.	11:59 P.M.	9:15 A.M.	1:15 P.M.
10:15 P.M.	12:15 P.M.	8:25 P.M.	9:51 P.M.	4:30 P.M.	6:00 P.M.
4:50 P.M.	7:45 P.M.	8:25 P.M.	1:30 A.M.	9:25 A.M.	9:25 A.M.
Ans. 4:01 P.M.	10:00 P.M.	Chicago	1:30 A.M.	7:19 P.M.	

The proportions of this map are seriously distorted. The distance from Mina to Hazen is roughly the same as from Mina to Goldfield.

Tonopah and Goldfield Railroad

The Tonopah and Goldfield Railroad operated 97 miles of line from a connection with the Southern Pacific at Mina to Tonopah (61 miles from Mina) and Goldfield, in Mineral, Nye and Esmeralda counties, Nevada.¹

The road for the most part ran through desolate desert valleys. Curvature was limited, and grades were minor except for the long ten mile straight 4 percent grade up into Tonopah.

The line was built in 1903-04 to Tonopah as a narrow guage line, and then standard guaged and extended to Goldfield in 1905.² The line was built and owned until 1942 by Philadelphia financial interests associated with the Tonopah Mining Company, one of the principal mine operators in the Tonopah area. The line was designed to serve the mining traffic

¹The first nine miles of track out of Mina were owned by the Southern Pacific and shared with the Southern Pacific's narrow guage line from Mina to Keeler, California.

What is now the Southern Pacific's Mina branch has from its earliest years been something of an anomaly. Most of the branch was built as a narrow guage line in 1882-83 by the Carson and Colorado, a subsidiary of the Virginia and Truckee, in one of the strangest episodes in U. S. railroad building. The line extended 300 miles, from a connection with the V and T at Mound House, east of Carson City, to Keeler, at the south end of the Owens Valley in California, through an almost uninhabited wilderness. The C and C was purchased by the Southern Pacific in 1900, the portion north of Mina standard guaged in 1905, and a direct link built with the Southern Pacific main line at Hazen in the same year. One by one the connecting lines were abandoned--the Churchill-Mound House portion in 1934, thus severing the link with the V and T; the narrow guage portion from Mina over Montgomery Pass into California in 1938; the Nevada Copper Belt in 1947; the Tonopah and Goldfield in the same year. Today the line does not directly serve a single community with population in excess of 400; there are only four shipping points of any consequence in 129 miles--yet the line carries a substantial volume of traffic, mostly mineral products. Virtually all of the traffic has to be trucked to the rail sidings.

²Myrick, Railroads of Nevada, op. cit., pp. 236-92.

and the two cities that developed as a result of the mining boom.¹ The line became a portion of a through route from Reno to Las Vegas and Los Angeles with the completion of the Bullfrog-Goldfield Railroad in 1907, but the direct Las Vegas link was broken with the abandonment of the Las Vegas and Tonopah in 1918, and all connections to the south in 1928 when the Bullfrog line was abandoned.

The Tonopah and Goldfield was highly profitable in its early years. In 1909, for example, its gross revenue was \$2.4 million, its net railway operation income was \$850,000. But the Goldfield boom quickly ended and that city declined rapidly, finally being almost wiped out by fires in 1923 and 1924. Tonopah silver production lasted much longer, but gradually declined, and the city with it.

Railroad revenues gradually fell until they were only ten, and finally, five, percent of the figures of earlier years, but the railroad was successful for a long period in reducing expenses and earning a small profit. The passenger trains of early years gave way to a daily mixed train--which still carried a through Pullman from San Francisco until the early 'thirties. In the later period the road operated a mixed train three times a week, a motor train the other three work days. All mining operations in later years in Tonopah were on a leaser basis. A net loss appeared in 1937, but up through 1941 only in 1939 did the road fail to cover operating expenses, and the net losses were small. But in 1939, following the death of the president of the road, who had a strong interest in its continuation, the Tonopah Mining Company, itself out of the mining operations except leasing, sold the railroad to the Dulien Steel Products Company of Seattle

¹The Tonopah-Goldfield boom was the last of Nevada's major precious metal mining booms. The discovery came quite accidentally when late in 1901, Jim Butler, a farmer, itinerant prospector, and district attorney of Nye county, picked up a piece of rock when searching for his burro which had strayed while he camped overnight on a barren ridge, thought the rock looked promising, and sent it off for assay. Tonopah was mainly a silver producer, Goldfield, gold.

for scrapping. The sale price was \$227,000--or \$2,275 per mile. Before the new owners could act to attain approval and scrap the line, however, the Air Force established a base at Tonopah and required the railroad for transport, primarily of aviation fuel. The World War II years were extremely hectic ones, as the road sought to handle increased traffic with inadequate track and equipment and serious management difficulties. By 1945 all seven of the road's steam locomotives were out of service, and operations carried on with two diesels borrowed from the U. S. Government. When these were taken back in 1946, the road was unable to operate (and the management did not particularly want to continue) and application was filed for abandonment.

The abandonment was protested and extensive hearings were held.¹ The company stressed the inability of the road, now that the Air Force base was closed, to cover its expenses, the badly deteriorated condition of the track, and the lack of motive power. The seven locomotives were more than 40 years old, and no funds were available for rebuilding them. Considerable money had been spent on maintenance during the war, but in turn the track had been pounded badly by the heavy trains.

The abandonment was protested by Nye and Esmeralda counties, American Smelting and Refining Company, Great Lakes Carbon Company, the Reno Chamber of Commerce, the Verdi Lumber Company, and, ironically, the Tonopah Mining Company. The opposition centered on two aspects--the management policies and the adverse effects upon the area. The claim was made that

¹U. S. Interstate Commerce Commission, FD 15454 (1947).

the Dulien Company had no interest in continued operation, having bought the line for the profit to be made from the scrap; that it had made substantial profits during the war years, and then sought immediately to junk the line. Mismanagement was also charged; there was little doubt that the management in the last four years had been inept and chaotic.

The protestants stressed the effects of abandonment upon the mining of low grade ore, maintaining that the additional cost of trucking to the railhead at Mina would make mining uneconomic. The Tonopah Mining Company estimated an additional \$2.60 a ton to truck ore to Mina. The Great Lakes Carbon Company, shipping some 20 cars of diatomaceous earth a month from the siding at Coaldale before operations stopped, reported that it was costing an additional \$1.75 a ton to truck to Mina.

Protest about loss of rail service on inbound freight was confined to lumber, coal and cement dealers; it was estimated that the cost of bringing in coal would rise by \$5 to \$6 a ton, and that cost of lumber--primarily mining timber--would be increased substantially.

Traffic on the line by commodity in later years is shown in Table 6.

The Interstate Commerce Commission inevitably granted permission to abandon, citing the deteriorated condition of the line and the inability to cover costs with the air base closed down. The Nevada Public Service Commission, however, denied permission, on the grounds that profitable operation was possible; that the company had wasted funds and had bought the road with the specific intent of abandoning it; and that serious harm would result to the communities. The Commission was overruled, however, by the District Court, which indicated that abandonment could not be prevented in light of the losses.

TABLE 6. TRAFFIC OF TONOPAH AND GOLDFIELD RAILROAD, 1940-1944 AND 1946

	1940		1941		1942		1943		1944		1946-6 Mo.	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Cattle	5	2										
Wool		3									1	
Ore		420										39
Rails		13										
Scrap iron		16										
Diatomaceous earth												135
Coal		40										11
Posts, wood, lumber		36										1
Gasoline		132										43
Other petroleum products		218										46
Iron & steel, pipe, boilers		7										
Cement, lime		12										2
Cars, trucks		22										5
Meal		1										
Beverages		24										15
Food		39										
Manufactured goods		19										43
Tractors		2										
Explosives		24										1
Asphalt												13
Bottles												6
Miscellaneous	10	4										1
	591	458	678	446	873	561	1,390	498	2,453	381	188	174

Technically the road was abandoned October 15, 1947, but all operations had ceased October 1, 1946.

The traffic on the line was far below what is generally regarded as adequate for viable operations; in 1941, for example, the line originated or terminated only ten cars per mile of line. In 1940, ton miles per mile of line were only 26,435; in 1941, 29,531--intolerably low figures for a road nearly one hundred miles in length. The only way operations had continued as long as they had were the road's ability to operate freight service only three times a week, the relatively low maintenance costs, and a strong cash position maintained over the years of Tonopah Mining Company ownership.

The Effects

In some respects the effects are more difficult to trace than with the other two roads.

1. Communities. Nye and Esmeralda counties fell sharply in population, the latter by over 50 percent from 1940 to 1950, partly attributable to loss of railroad service (Table 7). Since then, Esmeralda has stayed constant, while Nye has increased, but mostly in the Gabbs Valley, not tributary to the T and G at all. Goldfield's population fell from 554 to 336 from 1940 to 1950, and much of this is attributable to the loss of about 30 railroad jobs (the shops and offices were located in Goldfield). The population has continued to decline, to about 200; only the location of the county government and visits by occasional tourists preserve any population at all. Tonopah serves as a trading center for a limited rural population, with some tourist travel and convention activity-- simply because it is halfway between Reno and Las Vegas. Despite a slight population gain, it is not a prosperous community. The effective buying power per household in Esmeralda county is a third less than of the state

TABLE 7
MINERAL OUTPUT, NYE AND ESMERALDA COUNTIES, AVAILABLE YEARS,
1939-1967

		<u>Number of Mines</u>	<u>Number of Employees</u>	<u>Value of Output 000s</u>
Esmeralda	1939	19	534	2,388
	1954	21	52	453
	1958	13	76	879
	1963	16	41	642
	1968	na	na	2,768 ²
	1972	na	72	3,452 ²
Nye	1939	42	484	2,037
	1954	61	161	2,912
	1958	27	335	3,204
	1963	25	400	1,559
	1968	19	257	2,771
	1972	na	306	2,047 ¹

SOURCE: U. S. Census of Mineral Industries; U. S. Bureau of Mines, Minerals Yearbook (for value of output except 1939.)

¹Primarily magnesite
²Primarily lithium

as a whole. Twenty-eight percent of the households have annual income under \$3,000 in Esmeralda, 18 percent in Nye, compared to 13 percent for the state as a whole. The decline had continued for a long time before the railroad had been abandoned, and abandonment, apart from substantial relative effect on Goldfield because of the loss of jobs, had little impact, except as noted below with respect to mining development.

2. Mining. The basis of economic activity in the area is mining, as noted above and all ore and concentrate had moved by rail. But the gold and silver mining of the early part of the century has never revived on any scale. The best ore had run out by 1940, and the closing of the remaining mines under War Production Board orders to free personnel for war related purposes brought an end to the few remaining mines. There is some exploration and often predictions of a new boom, but it has not occurred. There are two limiting factors, among others: the ownership of many claims by Howard Hughes, and the closing of much of Nye county to prospecting because of its use as a bombing range. The lack of a railroad is, in the estimation of persons familiar with mining potentialities in the area, definitely a handicap because of the higher cost of trucking the ore to Mina.¹ If mining develops on a large scale and a concentration mill is built, the added transport costs would be much less than for moving the ore.

There have, however, been important developments in non-precious metal mining. There are several:

¹For example, U. S. Bureau of Mines officials in Nevada expressed as follows: ". . . the railhead, if it was extended south of Mina, would revive the mining of silver, gold, copper, and molybdenum ore deposits in central Nevada (Nye and Esmeralda counties). Presently gold production in that area is very small. The gold is usually retorted into bullion bars." (Letter from Carson City office, U. S. Bureau of Mines, May 2, 1975).

a. Diatomaceous earth, talc and related items, which have been produced for several decades. Some added costs are incurred in trucking to Mina. The principal diatomaceous earth production, however, is near Lovelock, on the Southern Pacific main line.

b. Magnesium, at Gabbs, in the northwest portion of Nye county, by Basic, Inc. The output is trucked to Luning and shipped by rail. But this area is not tributary to the Tonopah and Goldfield line and abandonment of the line had no significance whatever.

c. Lithium, now mined at Silver Peak. Silver Peak once had a railroad connection, of the same name as the town, between 1906 and 1918, when gold production was substantial. But the line was abandoned in 1918 when the ore gave out. This line connected with the Tonopah and Goldfield at Blair Junction, 31 miles west of Tonopah.

In recent years Foote Minerals has commenced to produce lithium at Silver Peak. The product is trucked 52 miles to Mina. The existence of a railroad would have facilitated the development. The Silver Peak line has been out for 65 years and it is rather useless to speculate about it; but the retention of the T and G would have greatly reduced the truck haul. But the lack of the railroad has not prevented the development.

d. As another example, barite is mined 150 miles east of Mina, trucked to Mina, and shipped by rail to Houston for processing. The truck haul would have been much less if the T and G was still in operation.

Total mineral output is shown in Table 7.

The net effect of these changes, as shown in Table 7, is that total mining employment and output fell drastically in Esmeralda county and

revived only after lithium production began in the mid sixties, while Nye county, much closer to the railhead, has experienced much less decline in employment and a more stable value of output.

4. Agriculture. Agriculture in Esmeralda county and the portions of Nye and Mineral counties tributary to the T and G is very limited, confined to very large range cattle ranches. The average farm (ranch) size in Esmeralda county is reported to be 131,000 acres (worth, in 1964, an estimated \$3 an acre). There are some 6,000 cattle in Esmeralda county and limited hay production (on 2,000 acres). Total value of farm produce--mostly cattle--in 1967 was \$443,000. Nye county has more cattle (29,000) and hay production, but most of it in areas not tributary to the railroad. The railroad at the time of its abandonment was of only nominal importance for agriculture; the cattle moved by truck, and little feed was brought in. The abandonment, therefore, was of no importance for agriculture; nothing short of a miracle could turn Esmeralda county into a productive farming area.

5. Manufacturing and wholesale distribution. The population of the area is far too small and the area too remote for any wholesale development comparable to that of Reno. Likewise, the area is not only too remote for manufacturing location but has no water supply.

Conclusions

The overall conclusions are that abandonment of the T and G has probably had some deterring effect on the revival of gold and silver mining, and perhaps other forms, in Nye and Esmeralda counties and has resulted in somewhat higher costs for other mineral producers, but had not prevented the non-precious metal mining developments in the area. Abandonment did have serious effects on the town of Coldfield, in view of the importance of railroad employment compared to total employment.

Comparison with Churchill County

As indicated in the introduction, it is impossible to find control areas that are identical to those under study. But in this instance there is some potential advantage in comparing data for Douglas and Lyon counties with those for Churchill county, located north of Lyon, and still having rail service to the principal town, Fallon. Examination of Table 2 shows that Churchill county gained population from 1940 to 1950, the period in which the other rail lines were abandoned, whereas Douglas and Lyon, as well as Esmeralda and Nye, lost population. Churchill county is very similar in its economy to Douglas and Lyon (except that there is little mining activity); Table 8 shows the trends in agriculture. This is also a cattle and hay producing county, with a much more rapid increase in the number of cattle than in either of the other two counties. But it is impossible to determine the extent to which the availability of rail service has played a role. The Southern Pacific branch to Fallon from Hazen no longer has scheduled freight service, cars being brought in when traffic warrants. It is the estimate of the Chamber of Commerce officials that the line is currently not of much significance. Cattle and hay move by truck. Some livestock feed moves in over the line, as well as equipment for the Naval Air Station east of the town. The lumber yard does not make significant use of the railroad. The Chamber of Commerce does regard the retention of the rail line as imperative for the new industrial park currently being promoted. But except for the inbound traffic in feed, the retention of the line has apparently not been a major element in the development of the county, given its hay and cattle base.

TABLE 8. AGRICULTURAL PRODUCTION IN CHURCHILL COUNTY.
1939-1969

	<u>1939</u>	<u>1945</u>	<u>1949</u>	<u>1959</u>	<u>1969</u>
Number of farms	597	615	642	544	423
Acreage in farms	102,000	124,000	152,000	128,000	323,000
Value of farms . output, total	1,172,000		3,727,000	6,933,000	9,493,000
Livestock					7,991,000
Cattle, number	14,000	21,000	24,000	35,000	51,000
Sheep, number	42,000	26,000	9,000	10,000	13,000
Hay: Acreage	20,000	22,000	26,000	23,000	27,000
Output, tons	53,000	58,000	75,000	80,000	107,000
Wheat: Acreage	5,000	6,000	4,000	3,000	1,500
Output, bushels	155,000	131,000	108,000	117,000	94,000
Barley: Acreage	4,000	4,800	5,000	3,000	4,000
Output, bushels	138,000	167,000	132,000	127,000	252,000
Potatoes: Acreage	57	1,216	n	n	n
Output, 100 wt.	7,000(bu)	241,000(bu)	n	n	n

n: negligible

SOURCE: U. S. Census of Agriculture, respective years.

APPENDIX TO PART I

STATISTICS OF THE THREE RAILROADS DURING THE PERIOD BEFORE ABANDONMENT

Tables A1, A2, and A3 provide the statistics of the three railroads during the later years. The World War II years are omitted for the T and G since they were distorted by traffic for the air base and had no significance for the abandonment decision, which was essentially made in 1942 with the sale of the road to a scrap dealer.

The roads had several features in common. All were originally built by mining interests. Mining traffic declined sharply, especially over the years, and two of the roads became primarily dependent on agricultural traffic of a type very vulnerable to truck competition. The T and G and the V and T were extremely profitable in their early years and adapted to sharp declines in traffic. The Nevada Copper Belt was the weakest road throughout, with a volume of traffic clearly insufficient to make the line viable, certainly beyond Mason. Yet it was the one whose abandonment was to result in the greatest economic loss over time. The T and G had been able to survive so long as its traffic exceeded 40,000 ton miles per mile, but once traffic fell below, losses appeared. The V and T had a long period of losses; and even the rise in traffic over 40,000 ton miles per mile was unable to save it. Both the V and T and the Copper Belt were very vulnerable to further losses in traffic--hay, cattle, and petroleum products--which would have rendered operation hopeless. The T and G was less vulnerable, but also was by far the longest, and experience has been that roads over 25 miles or so with light traffic find continued operation impossible.

TABLE A1. REVENUES, EXPENSES, EARNINGS AND TRAFFIC
VIRGINIA AND TRUCKEE RAILROAD

000s						
	<u>Gross Revenue</u>	<u>Railway Operating Expenses</u>	<u>Taxes</u>	<u>Net Railway Operating Income</u>	<u>Ton Miles of Freight</u>	<u>Ton Miles per Mile of Line</u>
1891	\$684	\$348		\$336		
1939	88	77	7	+ 3	997	21,213
1940	91	91	7	- 8	950	20,212
1941	91	83	7	- 1	948	20,170
1942	103	92	8	+ 1	1,211	25,756
1943	89	118	8	-39	952	20,255
1944	87	110	8	-33	917	19,510
1945	108	123	9	-23	1,175	25,000
1946	143	157	11	-23	1,978	42,085
1947	171	173	13	-17	1,835	39,042
1948	152	182	11	-43	1,269	27,000

SOURCE: U. S. Interstate Commerce Commission, Statistics of Railroads.

TABLE A2. REVENUES, EXPENSES, EARNINGS AND TRAFFIC
NEVADA COPPER BELT RAILROAD

000s						
	<u>Gross Revenue</u>	<u>Railway Operating Expenses</u>	<u>Taxes</u>	<u>Net Railway Operating Income</u>	<u>Ton Miles of Freight</u>	<u>Ton Miles per Mile of Line</u>
1939	\$36	\$50	\$3	\$ -18	333	11,482
1940	32	19	3	9	283	9,759
1941	38	34	3	-.1	362	12,482
1942	56	65	3	-14	475	16,379
1943	75	90	6	-24	723	24,931
1944	56	74	4	-23	426	14,689
1945	62	70	4	-15	522	18,000
1946	51	54	4	- 8	430	14,828

SOURCE: U. S. Interstate Commerce Commission, Statistics of Railroads.

TABLE A3. REVENUES, EXPENSES, EARNINGS AND TRAFFIC
TONOPAH AND GOLDFIELD RAILROAD¹

000s						
	<u>Gross Revenue</u>	<u>Railway Operating Expenses</u>	<u>Taxes</u>	<u>Net Railway Operating Income</u>	<u>Ton Miles of Freight</u>	<u>Ton Miles per Mile of Line</u>
1909	\$2,381	\$1,531		\$850	20,418	210,415
1936	199	166	20	12	4,592	47,340
1937	180	165	19	- 3	4,697	48,423
1938	142	136	15	- 7	3,485	35,928
1939	127	134	13	-19	3,073	31,680
1940	118	154	21	-17	2,707	27,907
1941	134	128	10	- 6	3,024	31,175

¹The war years were not relevant for the basic decision to liquidate, made in 1942.

SOURCE: U. S. Interstate Commerce Commission, Statistics of Railroads.

Should These Railroads Have Been Retained Through Subsidy?

At the time these three roads were abandoned, there was no attention given to the alternative of preserving them by governmental subsidy; so far as can be determined, the issue was never once raised. The general philosophy of the 1940s was that if a road was not self-supporting, there was no alternative to abandonment. Today, with much greater recognition of externalities--of gains to society and to the particular communities from retention of the rail lines--the merits of subsidization are recognized, and subsidization provided, for example, in Federal legislation for restructuring the northeast railroads.

Whether these roads should have been retained through subsidization is not entirely clear. A case, from the point of view of 1975, could have been made for the Tonopah and Goldfield, despite its great length. Under Tonopah Mining Company ownership, the road had been able to operate at very low cost despite a low volume per ton mile. A railroad is particularly important to the mining industry, in which bulk products must be shipped long distances. A relatively small subsidy could have kept the road operating more or less indefinitely;¹ the line would, of course, have benefitted from the new mining developments in the area, and from

¹As late as 1940 the road had been maintained in satisfactory condition; the author rode the line from Mina to Tonopah and return in 1938, and both track and equipment appeared to be in acceptable shape--certainly by comparison with the typical midwest branch line of today. But about half of the 20 or so freight cars on the trip to Mina were gondolas containing used mill machinery destined for mining operation in Alaska, hardly a good portent for the future of Tonopah. Virtually all traffic was to and from Tonopah.

all evidence, would have allowed additional developments.¹ Its remaining traffic was not particularly vulnerable to motor competition, if it could have retained petroleum; and its traffic was of such nature that operation of trains no more than twice a week would have allowed adequate service; and dieselization would have lowered costs. Service south of Tonopah could have been discontinued,² the track kept in place for future mining development; on the Tonopah-Mina portion the ton miles per mile figure was nearly 50,000. The crucial time, of course, was 1942; sale to the Dulien firm sealed the subsequent fate of the line.

The weakest of the roads, financially, and the one subject to potential loss to trucks of most of its remaining traffic, was the Copper Belt. As noted above, however, abandonment proved to be a great mistake--yet as of 1947 there appeared to be little merit in its retention. This is an instance in which expectations proved to be seriously in error, and retention of the line would have been warranted.

Loss of the Virginia and Truckee did the least harm. As of 1949 it was in bad physical shape and vulnerable to the loss of much of its remaining traffic to trucks. The strongest case for retaining the V and T, including the Virginia City line, useless from a freight standpoint, would have been as an historical tourist attraction--a monument to the boom days of the mining era.

¹One obstacle to action was the small population of the two counties; another was the fact that Tonopah was not (and is not) an incorporated municipality.

²One restricting facet was the location of the shops in Goldfield.

PART II. THE GREAT SOUTHERN RAILROAD¹

The fourth line is the Great Southern Railroad, in Wasco county in north central Oregon directly east of the Cascades. Wasco is a county of diverse terrain, with forests on the east slope of the Cascades, fertile valleys between rolling ridges, and, to the east, approaching the Deschutes River, steep dry hills. The area was settled in the 1860s and 1870s. The commercial center is the old city of The Dalles, on the Columbia, long a major transport and commercial center for central Oregon. The Dalles has been served since the early 1880s by what is now the Union Pacific's main line to Portland.

Building of the Great Southern

Around the turn of the century, several plans developed for building a railroad south from The Dalles, but not until 1904 was construction actually undertaken. The immediate aim was Dufur, 15 miles south of The Dalles by road, center of a major agricultural area, primarily wheat. A secondary objective was the timber of Mt. Hood National Forest, southwest of Dufur. There was also some thought of building into central Oregon, but the great obstacle of Tygh Ridge and the need to cross the Deschutes were discouraging factors, and the building of the Deschutes River line put an end to this speculation. Service was opened to Dufur, November 30, 1905. In 1912-13 the line was extended 11 miles to the village of Friend, in the timbered country between Tygh Valley and the valley of Fifteen Mile Creek. The line was built by John Heimrich, Sr., who had made a fortune in Colorado mining and moved to the northwest, making investments in a number of fields. But the road was run by his son John, Jr. and the railroad from the beginning to end was almost synonymous with John Heimrich, Jr.

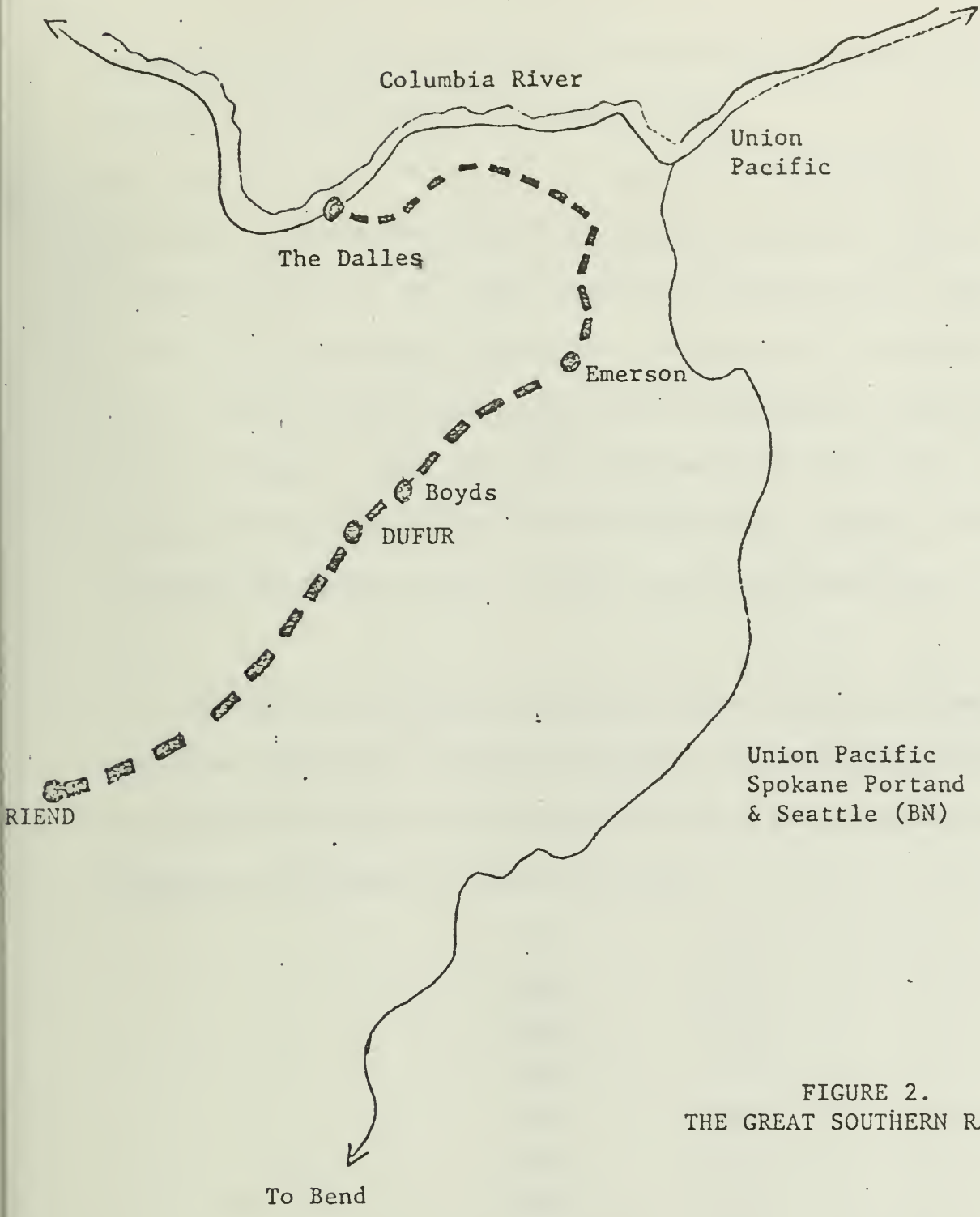
To avoid the hills south of The Dalles which the stagecoach road and modern highways crossed, the railroad followed Fifteen Mile Creek on its

¹Part II is condensed from Transportation Research Paper #5 (University of Illinois College of Commerce Working Paper #205, 1974).

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Portland

To Omaha



Union Pacific

The Dalles

Emerson

Boyds

DUFUR

RIEND

Union Pacific
Spokane Portland
& Seattle (BN)

To Bend

FIGURE 2.
THE GREAT SOUTHERN RAILROAD

long circuitous path to Dufur, swinging far to the east, close to but high above the Deschutes, between rough and jumbled hills.

The rail mileage to Dufur was 30, twice the road mileage.

When the extension was built to Friend, the line left the valley and climbed steadily up the ridge southeast of Fifteen Mile Creek, from about 1,000 feet at Dufur to 2,500 feet. The shops were originally located in Dufur, and the daily train came down to The Dalles in the morning, back in the evening. Later the shops were moved to The Dalles. Regular passenger service ended in 1928 with the end of the mail contract. The grading was limited; new 60 pound rail was used, with little ballast.

In addition to Dufur and Friend, there were several small villages on the line, Petersburg, Wrentham, Emerson, and Boyds being the most important, with grain elevators and warehouses. Only Dufur remained a town of any magnitude; population is indicated below:

1900	336
1910	523
1920	533
1930	382
1940	392
1950	422
1960	488
1970	493

The principal elevators and source of traffic were at Dufur. From beginning to end the primary traffic was wheat, although in time some lumber and log shipments were carried. Ultimately a small lumber mill was built at Friend. The hope of the period around 1900 that the area would become a

major fruit producer failed; rainfall was inadequate and in time the vast orchards were torn out. The northern fringe of the county produces large quantities of sweet cherries, but not in the area the railroad served.

Traffic, revenues, expenses, and profits for selected years are shown in Table 9.

Financial Difficulties

In the earlier years the road did reasonably well; it did not cover interest in most years, but the bonds were held primarily by the stockholders. After 1921, however, tonnage and the passenger traffic and revenues commenced to fall as trucks and cars took over the merchandise traffic and the passenger business. With the elimination of passenger train service, the road was able to restore operating profits but unable to cover property taxes, on which it commenced to default in 1926. The hope always lay in greater lumber traffic, and in 1926 Heimrich concluded a contract with the Forest Service for the cutting of two billion board feet of timber in the Mt. Hood National Forest, and construction was started on a lumber mill on the line and the Union Pacific three miles east of The Dalles. The logs would be brought down by rail. Before the mill was finished, lumber prices fell; the mill was left unfinished (and became a dance hall), and Heimrich eventually lost his Forest Service contract, despite the efforts of The Dalles Chamber of Commerce to save it. The railroad struggled on, but a series of unfavorable events were to destroy it. The physical condition of the road deteriorated and service became unreliable; the farmers, desperately hard pressed by low wheat prices, began to truck their wheat to The Dalles for shipment by water. In 1932 the road carried only one-third as much wheat as in the previous year. For that year the ton mileage per mile

TABLE 9

TRAFFIC AND REVENUE, GREAT SOUTHERN RAILROAD, SELECTED YEARS

<u>Year</u>	<u>Operating Revenues</u>	<u>Operating Expenses</u>	<u>Net Revenue from Railway Operation</u>	<u>Net Income</u>
1905-16 average	\$45,331	\$24,096	\$19,601	.
1921-30 average	52,207		15,257	\$- 30,121
1921	97,909	59,351	31,577	- 21,051
1924	65,678	52,170	4,549	- 22,588
1925	39,321	53,547	-19,976	- 54,115
1926	42,168	28,892	5,938	- 28,277
1927	40,941	26,186	7,328	- 27,083
1929	33,093	18,686	4,916	- 5,091 ¹
1930	20,223	23,078	- 1,855	- 9,225 ¹
1931	16,008	9,942	6,066	2,294 ¹
1932	5,755	6,588	- 833	- 4,539 ¹
1933	7,974	10,064	- 2,110	- 3,728 ¹
1934	9,556	9,296	- 266	- 1,545 ¹
1935-6 mos.	2,700	4,200	- 1,400	- 2,700 ¹

¹No interest paid

TONNAGE BY TYPE OF COMMODITY

<u>Year</u>	<u>Wheat</u>	<u>Fruit</u>	<u>Petroleum</u>	<u>Forest Products</u>	<u>Total</u>
1921	30,306	ns	ns	2,477	34,039
1924					26,381
1925					12,856
1930	12,078	114	175	ns	12,849
1931	12,204	13	0	ns	12,440
1932	3,875	0	144	ns	4,051
1933	5,483	14	151	ns	5,674
1934	6,739	107	38	ns	6,895

ns - not reported separately

SOURCE: Interstate Commerce Commission, FD 10880
and Statistics of Railways, Annual

of line was only about 3,000--an incredibly low figure. The track was so bad that it was difficult to keep trains on the track. The road was soon down to two employees, Heimrich himself doing much of the work.

Further complications arose when Heimrich lost control of the road to his sister and brother-in-law following settlement of the father's estate. The brother-in-law attempted to revive the line but without success; operation was spasmodic for two more years, with some wheat being handled. Finally, in July 1935 application to file was made, and all service ended in April 1936, and the line was scrapped.

There were no protests for the request to abandon; the only initial objection came from firms served by a spur line in The Dalles that would be left without service. The firms involved bought this track and deeded it to the Union Pacific, which still operates it.

The Effects of Abandonment

The immediate effects were not great. Much of the Dufur area wheat was already being trucked directly to The Dalles. The elevators in Dufur suffered some loss because trucking of grain from the elevators was somewhat more expensive than rail, but the difference was not great. At about this time the Dufur elevators collapsed and were rebuilt on higher ground away from the railway right of way. The enterprise, a corporation but farmer-

owned, continues to function as a commercial elevator, the grain trucked primarily to Interior Elevators and Cargill in The Dalles for shipment to Portland by barge. Grain from the Wrentham-Petersburg area all goes directly to The Dalles, either at harvest or out of farm storage. Between Dufur and Tygh Ridge, about 40 percent goes into farm storage and thence directly to The Dalles; about 60 percent into the Dufur elevator. In southern Wasco County, beyond Tygh Ridge, some wheat goes directly to The Dalles, the rest to the elevator on the rail line at Maupin (owned by Interior Elevators). The other elevators have ceased to be commercial elevators; the ones at Rice and Emerson are used for farm storage by the owners, while the one at Boyds is unused.

The significant effect of abandonment, however, and one clearly foreseen, was that upon the future location of lumber mills. The Dalles did have a mill for a time, but it was abandoned after a few years, partly because of problems of getting the logs in. If the railway had stayed in operation, the mills might have located in the Friend area or Dufur and the lumber shipped by the railroad, or in The Dalles, with the logs shipped down by rail. Instead, when the Mt. Hood timber cutting began, mills were built in Tygh Valley and in Maupin, southeast of the timber sources.¹ Neither is an ideal location. Tygh Valley never has had a railroad, and the finished lumber must be trucked 8 miles to a siding on the Burlington Northern - Union Pacific line at Sherars. It is not possible to obtain figures of the cost of this trucking, but the cost of loading and

¹The mill at Maupin burned in 1953 and was purchased and rebuilt by the Mountain Fir Lumber Company of Independence, Oregon. Mountain Fir purchased the Tygh Valley mill in 1960.

unloading the trucks and operating them is not negligible. It is reported that the task requires one truck and driver full time. The situation at Maupin is little better. Maupin is located on the steep west bank of the Deschutes, the railroad tracks at the bottom, the only level ground one thousand feet, more or less, above. The site of the town itself is suitable only for a training school for Rocky Mountain goats. The mill is of course on the plateau above, and the lumber must be trucked down the steep road to the rail siding. The chips are ingeniously sent down through a pipe directly into the freight cars 1,000 feet below.

If the Great Southern had not been abandoned, therefore, the mills might have been located in a more optimal location and The Dalles would have benefitted. But no thought was given in the 1930s to having the city or county take over and operate the line to preserve it.

In general, the Great Southern was a victim of circumstances. Had national recovery of the economy, with higher lumber prices, come sooner, the opening of lumber production would have saved the line in all probability. Had John Heimrich not been so involved in family feuds and if he had dealt somewhat differently with his shippers,¹ he might have been able to carry the road through until recovery came. From the standpoint of agriculture, the loss of the railroad was not significant; from the standpoint of lumbering it clearly was. Had not businessmen of The Dalles been so financially hamstrung by the depression and bank failures, an organized attempt might have been made to save the road.

¹Heimrich was basically a very wealthy man, but his assets were highly illiquid. Despite his wealth he spent much of his time maintaining the locomotives. But it is reported that he had an unfortunate tendency to try to squeeze too much out of some of the shippers for too little in the way of service.

PART III. GENERAL CONCLUSIONS

Analysis of the abandonment of these four roads after a period of 25 to 38 years following abandonment confirms the hypothesis that despite the inability to quantify the consequences, it is possible to derive significant conclusions about impact by review of actual and potential developments in the areas served.

More specifically, the primary conclusions reached are as follows:

1. The overall effect on the development of the communities during the last three decades was limited. All towns except Tonopah and Goldfield, primarily dependent upon mining, have increased in population since 1940, although extraneous factors--particularly the tourist industry--have played a major role in Carson City's growth. Abandonment did contribute to the final decimation of Goldfield by loss of railroad employment. It must be remembered, however, that traffic on these lines was limited at the time of abandonment, and most of the remaining traffic--primarily petroleum products, cattle, and hay--was of types readily taken over by trucks. The hauls were relatively short; little traffic went farther than California.

2. The effects of rail abandonment upon agriculture were negligible. Loss of a line was shown to have little effect when:

a. An area is almost entirely a producer of feeder cattle, raised on locally produced hay (the Carson Valley).

b. An area primarily produces hay, either fed to cattle locally or shipped to feed lots or dairies located within a 250-mile radius--Mason (Yerington) and Smith Valleys.

c. Markets for other agricultural products are located within 250 miles (the Carson, Mason and Smith Valleys).

d. An area producing export grain is located close to water transport (Dufur).

e. Grain for cattle is obtainable from sources within 250 miles-- southern Idaho in the case of the Smith and Mason Valleys. If grain must come from longer distances, higher costs result.

3. Loss of rail service did not prevent the development of light industry, of an electronics nature, in Carson City and Minden, the firms shipping almost entirely in LTL amounts.

4. Loss of rail service has prevented the development in the areas of wholesale distribution activity requiring rail service. The Reno-Sparks area on the Southern Pacific has experienced substantial development of warehousing and wholesale distribution activity in recent years, and Fallon, also on a rail line, is seeking this development. Such development is impossible for points no longer on rail lines.

The Nevada Department of Economic Development reports that three-fourths of all inquiries received about possible location in the state indicate a requirement for direct access to rail service.

5. Loss of rail lines has resulted in somewhat higher costs for mining operations and has apparently deterred revival of mining in Nye and Esmeralda counties in Nevada, although quantification of the effects is impossible. Loss of a rail line has resulted in substantially higher transport costs for the Anaconda copper operations near Yerington--operations not foreseen when the railroad was abandoned.

The loss of the rail line has not prevented the development of magnesium and lithium mining in central Nevada but has in some instances affected costs adversely. It is believed by persons knowledgeable about gold and silver mining in Nye and Esmeralda counties that the lack of a railroad has interfered to some extent with the revival of mining of these two metals.

6. Loss of rail lines in an area near timber resources (Great Southern, Virginia and Truckee) may result in nonoptimal location of sawmills and lumber mills, compared to the locations that would have been possible with the rail lines. Dufur or Friend would have been more advantageous locations than those of the present mills at Tygh Valley and Maupin, which lack direct access to a rail line, and in Nevada, lumber production would have been facilitated if a rail line still served Minden.

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